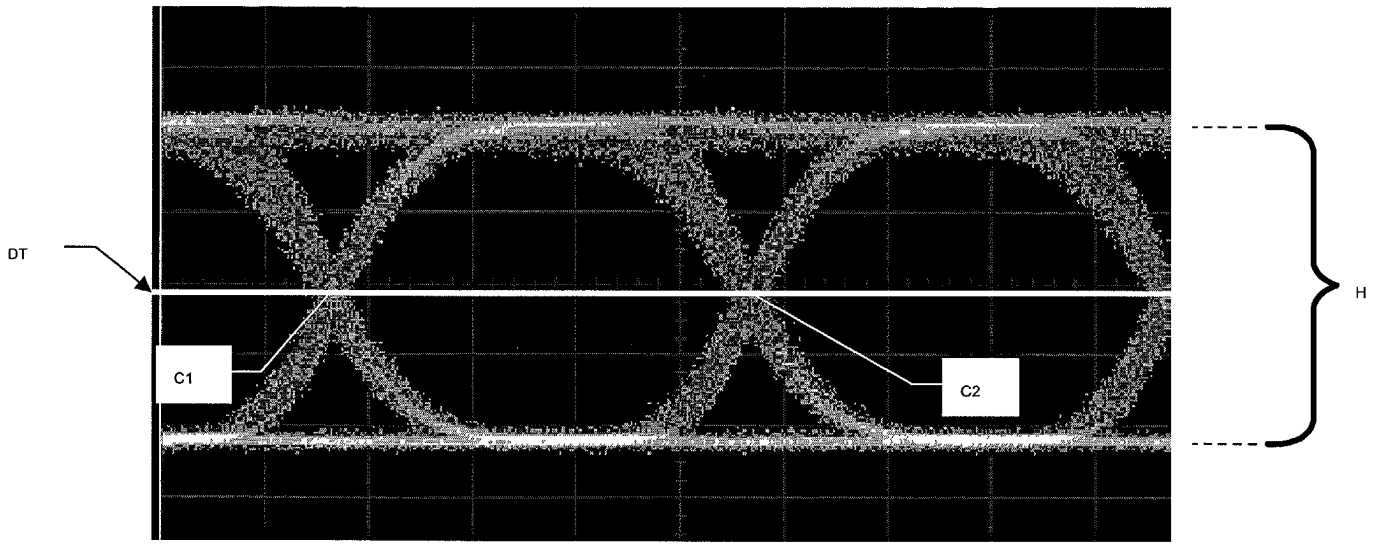

Figure 1a

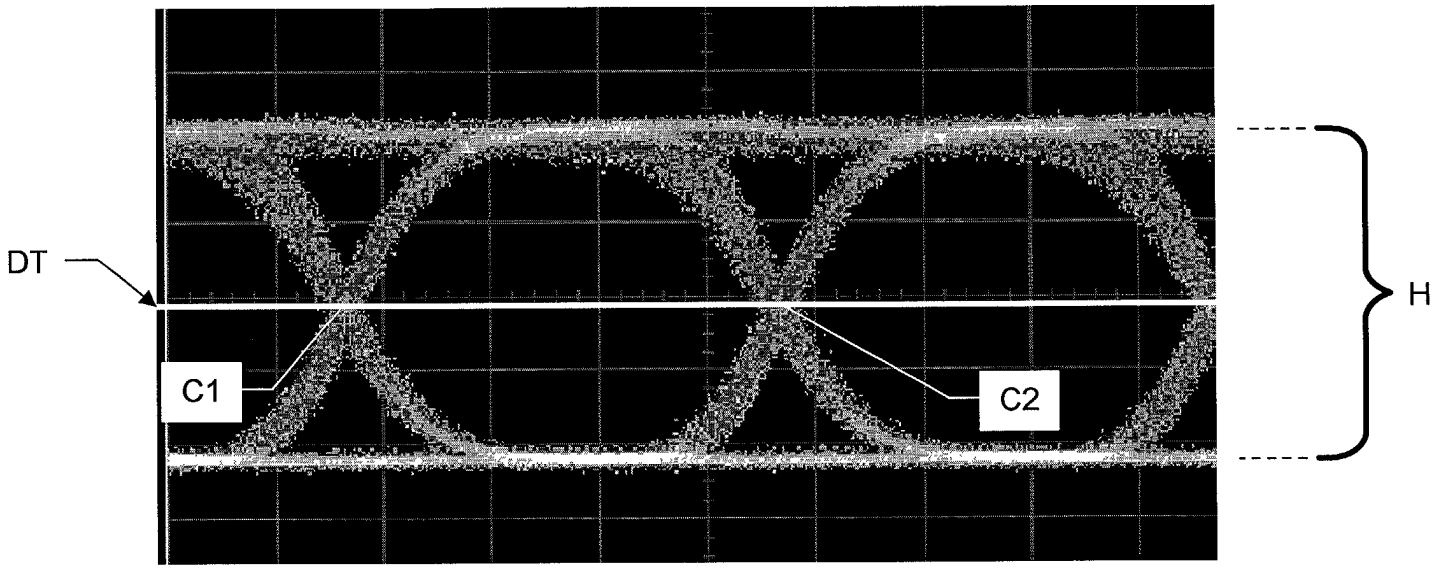

Figure 1a

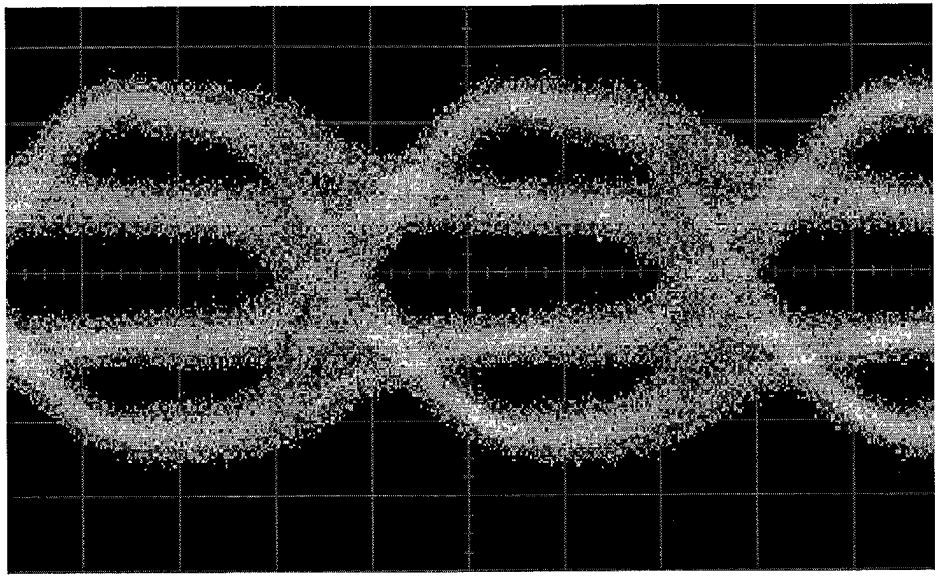

Figure 1b

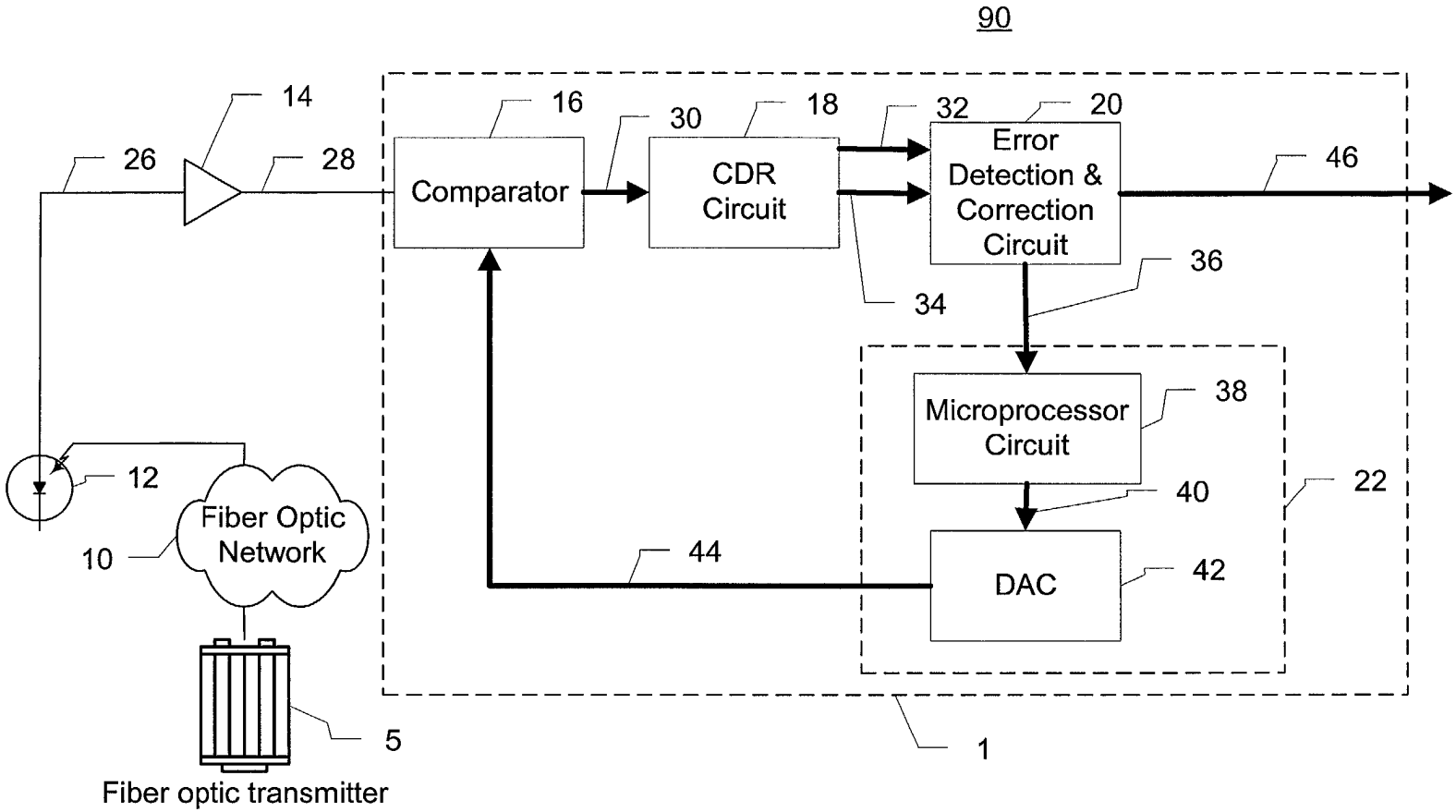
90
14
16
30
18
32
20
26
28
Comparator
CDR Circuit
Error Detection & Correction Circuit
46
34
36
Microprocessor Circuit
38
12
40
22
Fiber Optic Network
10
44
DAC
42
5
1
Fiber optic transmitter

Figure 2

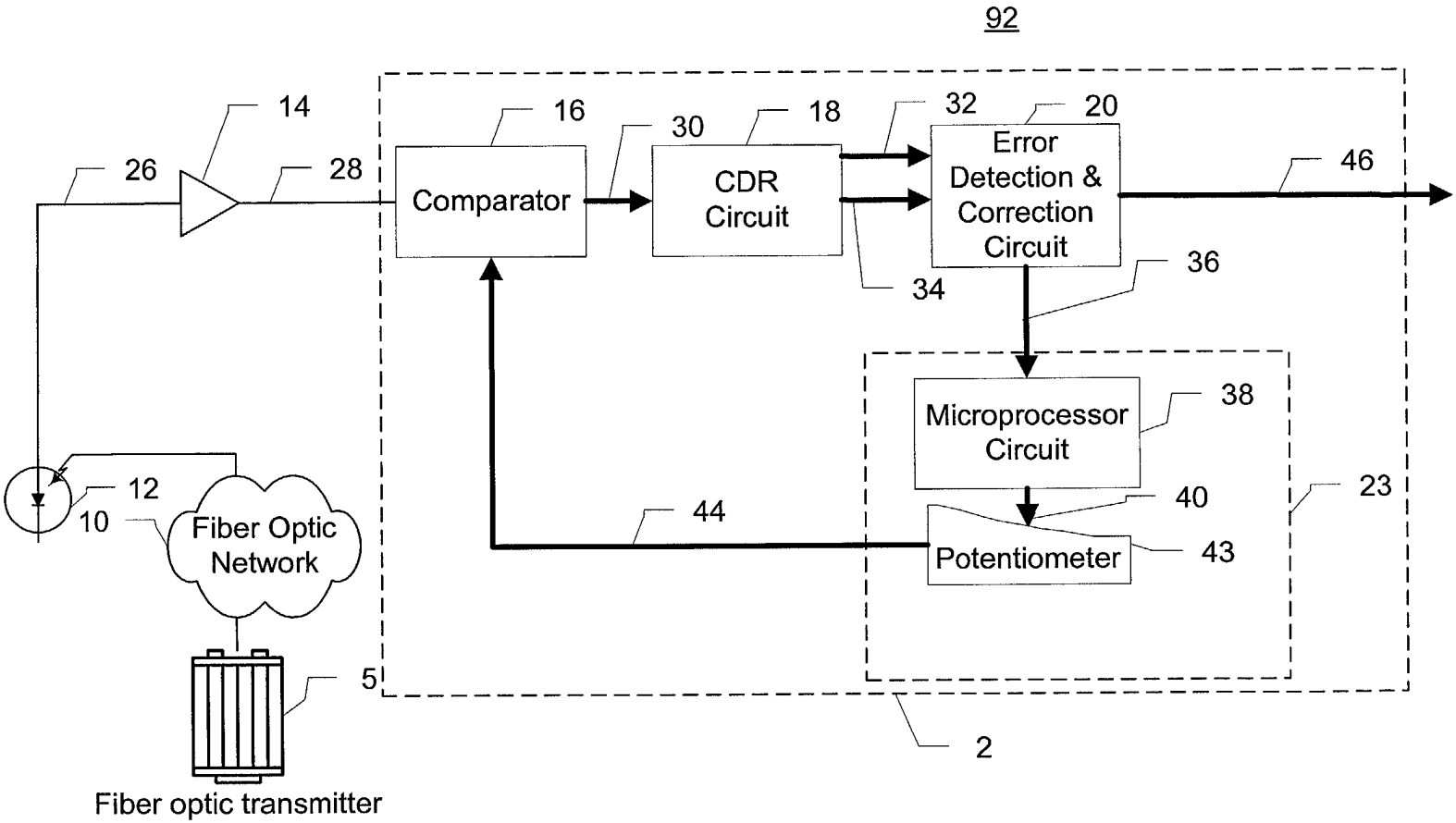
92
14
16
30
18
32
20
26
28
Comparator
CDR Circuit
Error Detection & Correction Circuit
46
34
36
Microprocessor Circuit
38
12
10
Fiber Optic Network
44
40
23
Potentiometer
43
5
2
Fiber optic transmitter

Figure 3

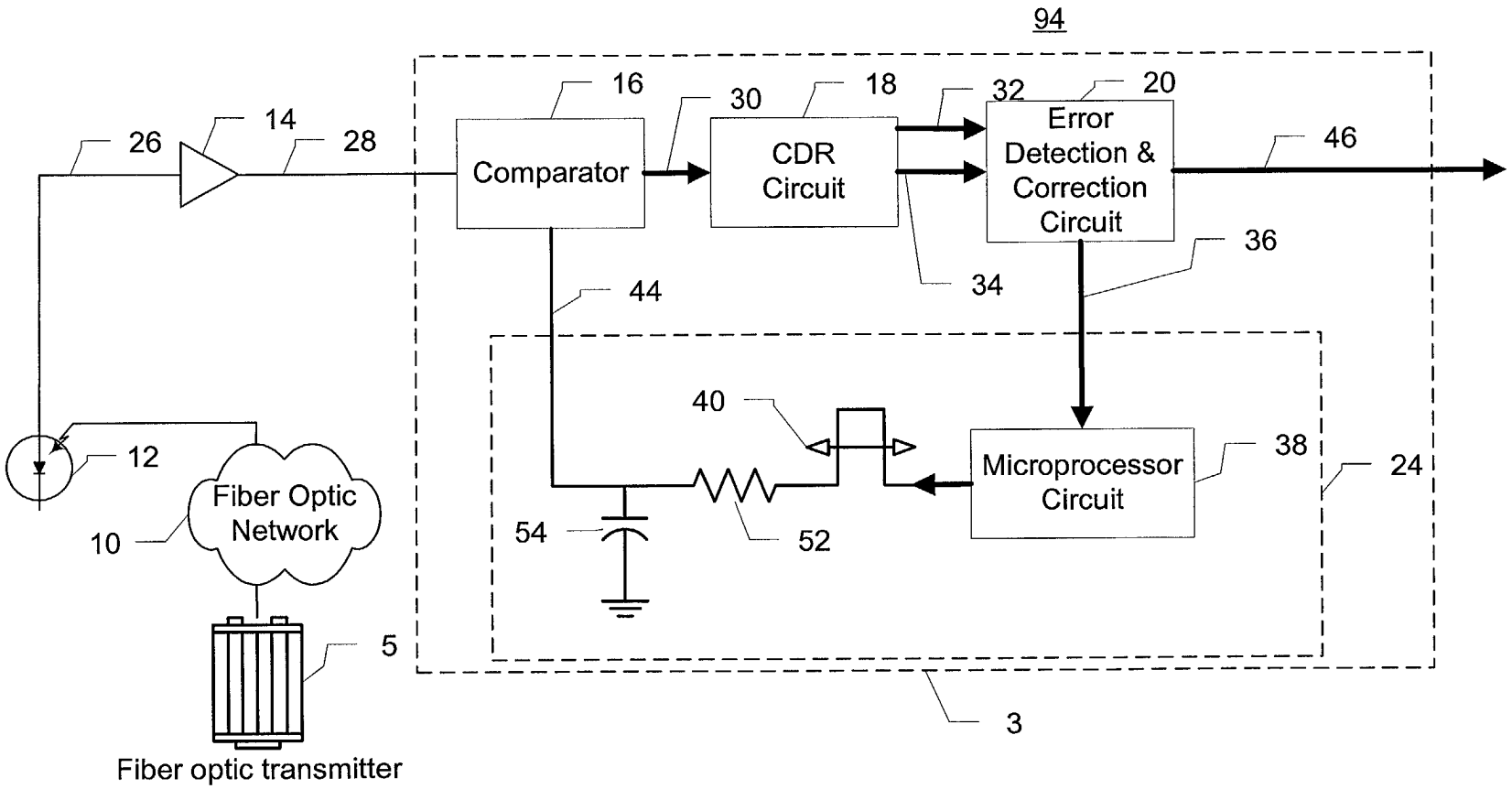
94
16
30
18
32
20
Error Detection & Correction Circuit
46
26
14
28
Comparator
CDR Circuit
34
36
44
40
38
24
Microprocessor Circuit
12
Fiber Optic Network
10
54
52
5
3
Fiber optic transmitter

Figure 4

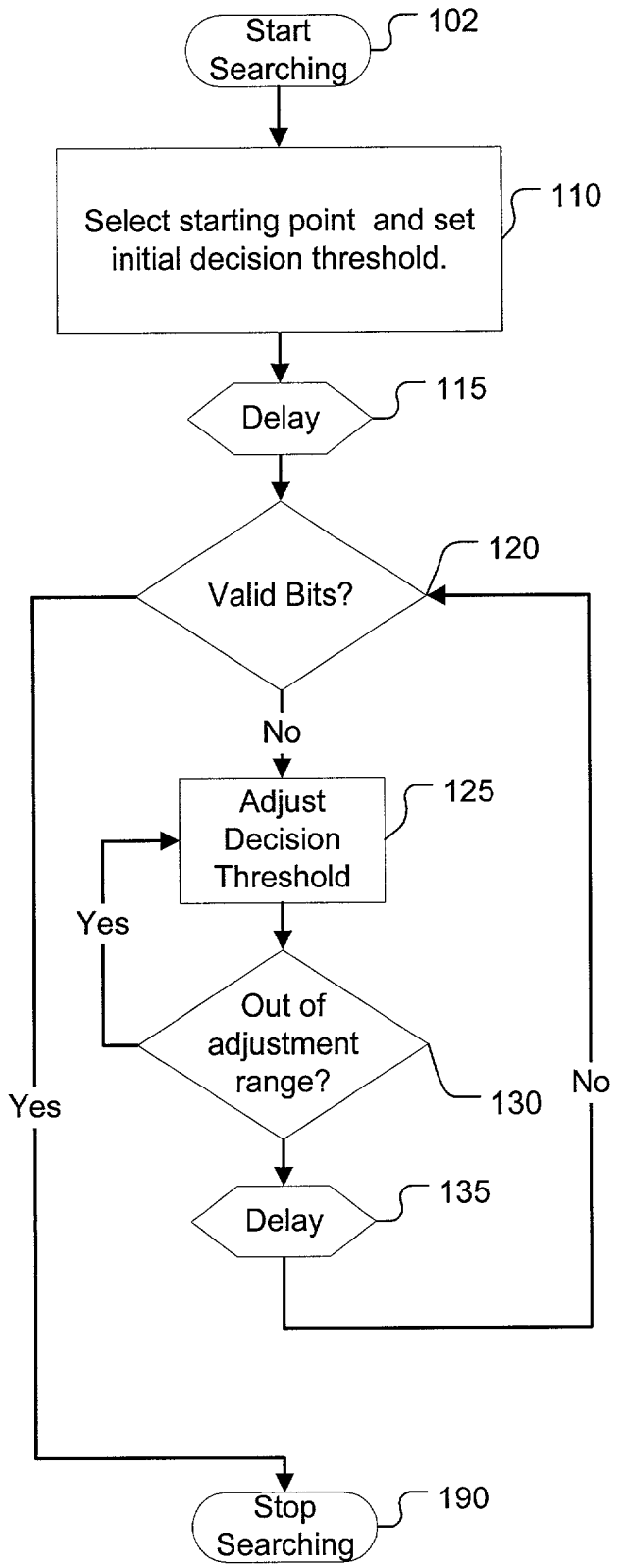
Start Searching
102
100
Select starting point and set initial decision threshold.
110
Delay
115
Valid Bits?
120
No
Adjust Decision Threshold
125
Yes
Out of adjustment range?
130
No
Yes
Delay
135
Stop Searching
190

Figure 5

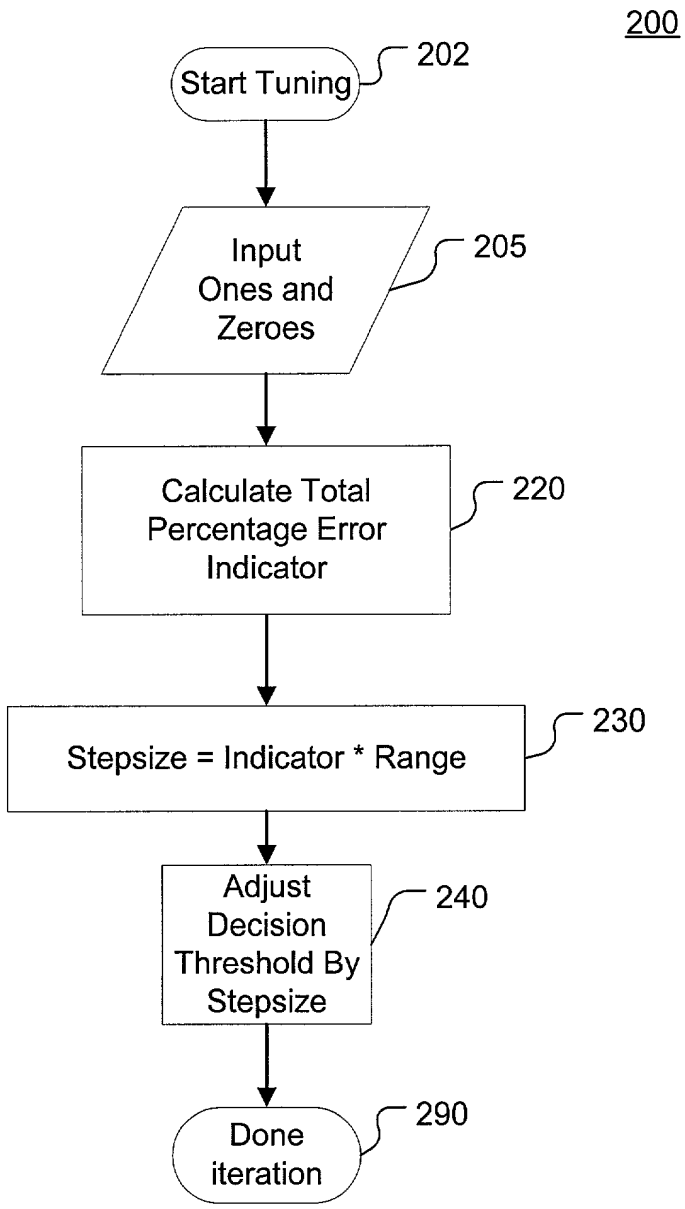
200
Start Tuning
202
Input
Ones and
Zeroes
205
Calculate Total
Percentage Error
Indicator
220
Stepsize = Indicator * Range
230
Adjust
Decision
Threshold By
Stepsize
240
Done
iteration
290

Figure 6

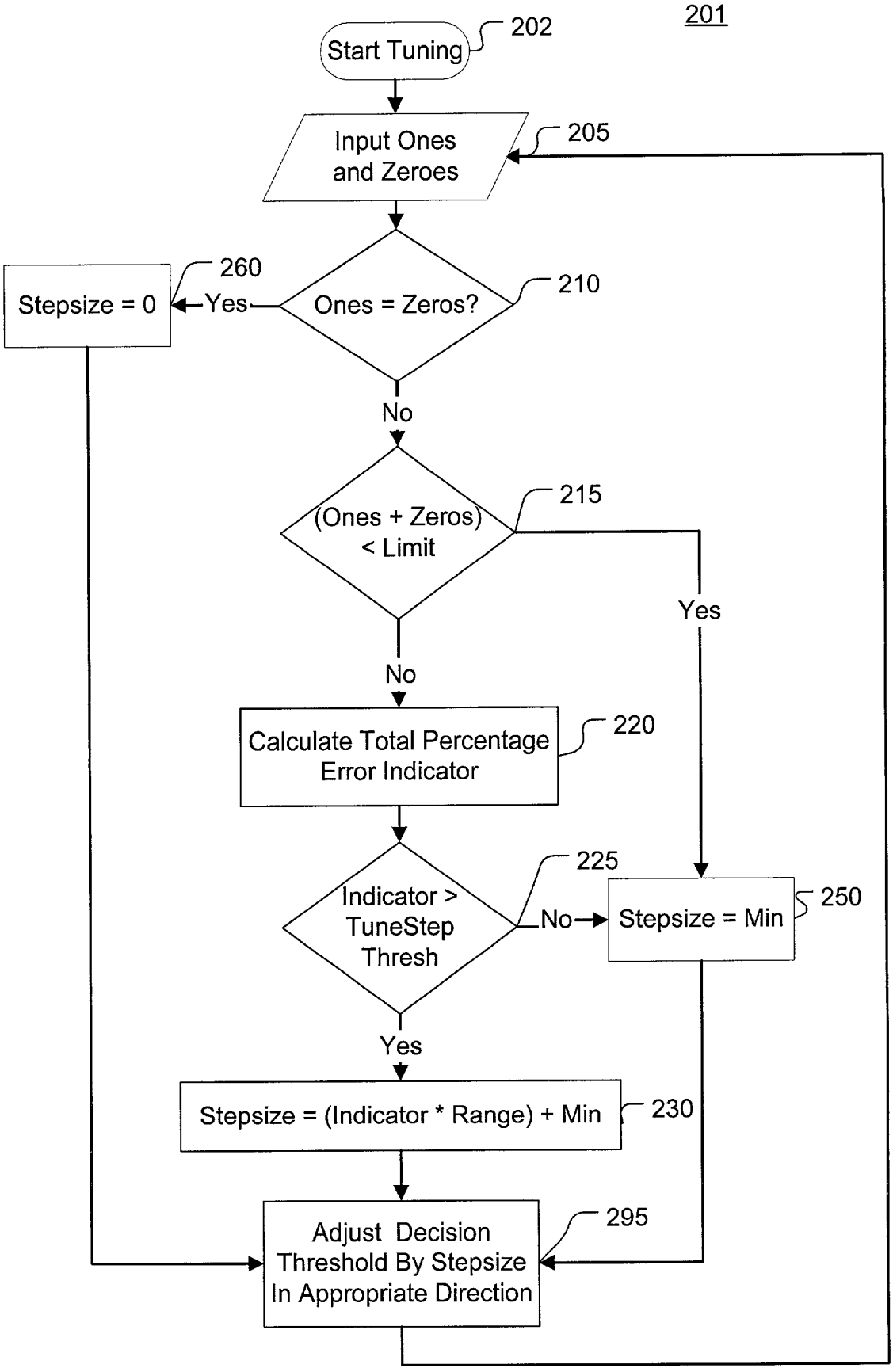
201
Start Tuning
202
Input Ones and Zeroes
205
Ones = Zeros?
210
Yes
Stepsize = 0
260
No
(Ones + Zeros) < Limit
215
Yes
No
Calculate Total Percentage Error Indicator
220
Indicator > TuneStep Thresh
225
No
Stepsize = Min
250
Yes
Stepsize = (Indicator * Range) + Min
230
Adjust Decision Threshold By Stepsize In Appropriate Direction
295

Figure 7

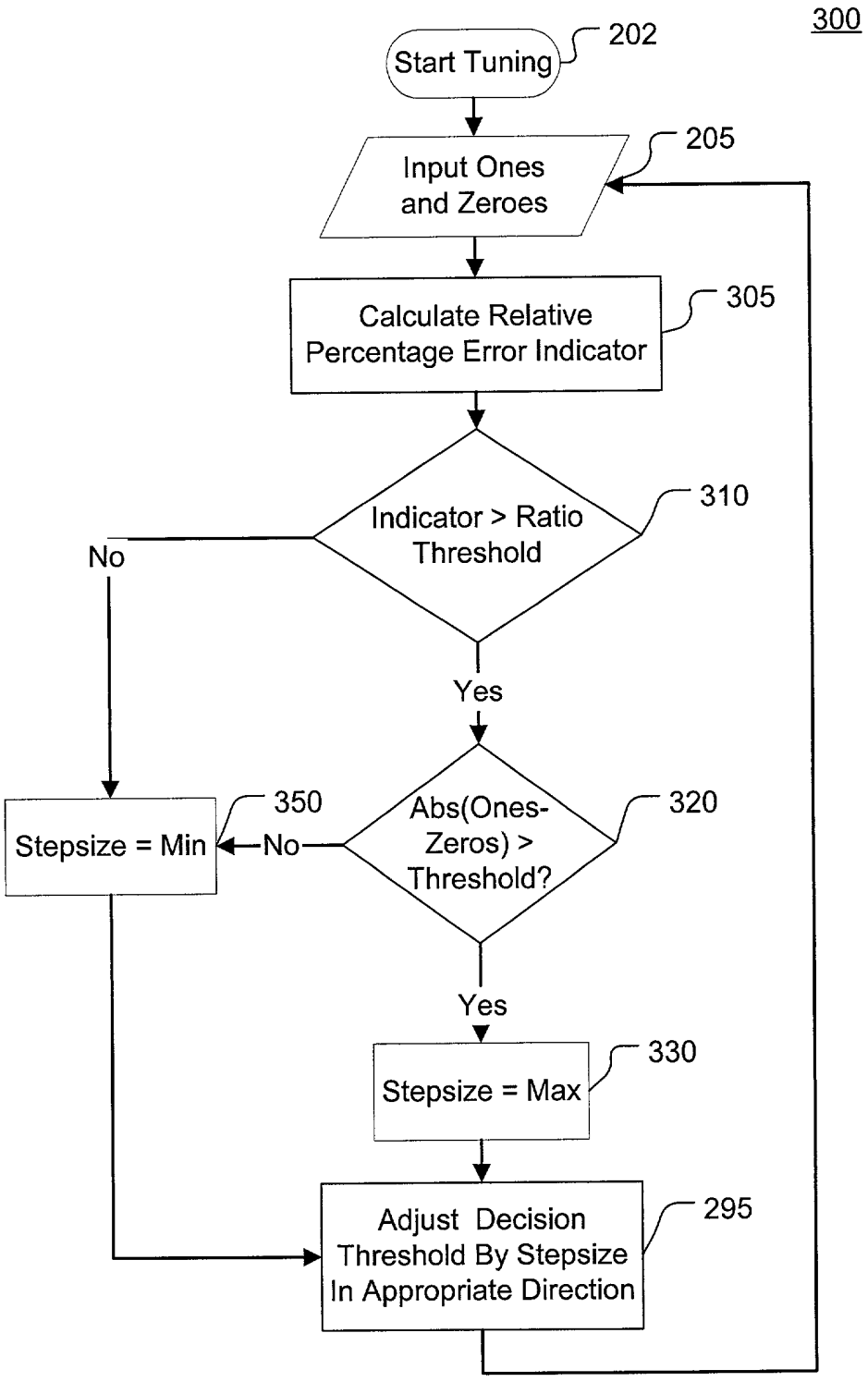
300
Start Tuning
202
Input Ones and Zeroes
205
Calculate Relative Percentage Error Indicator
305
Indicator > Ratio Threshold
310
No
Yes
Abs(Ones-Zeros) > Threshold?
320
Stepsize = Min
350
No
Yes
Stepsize = Max
330
Adjust Decision Threshold By Stepsize In Appropriate Direction
295

Figure 8a

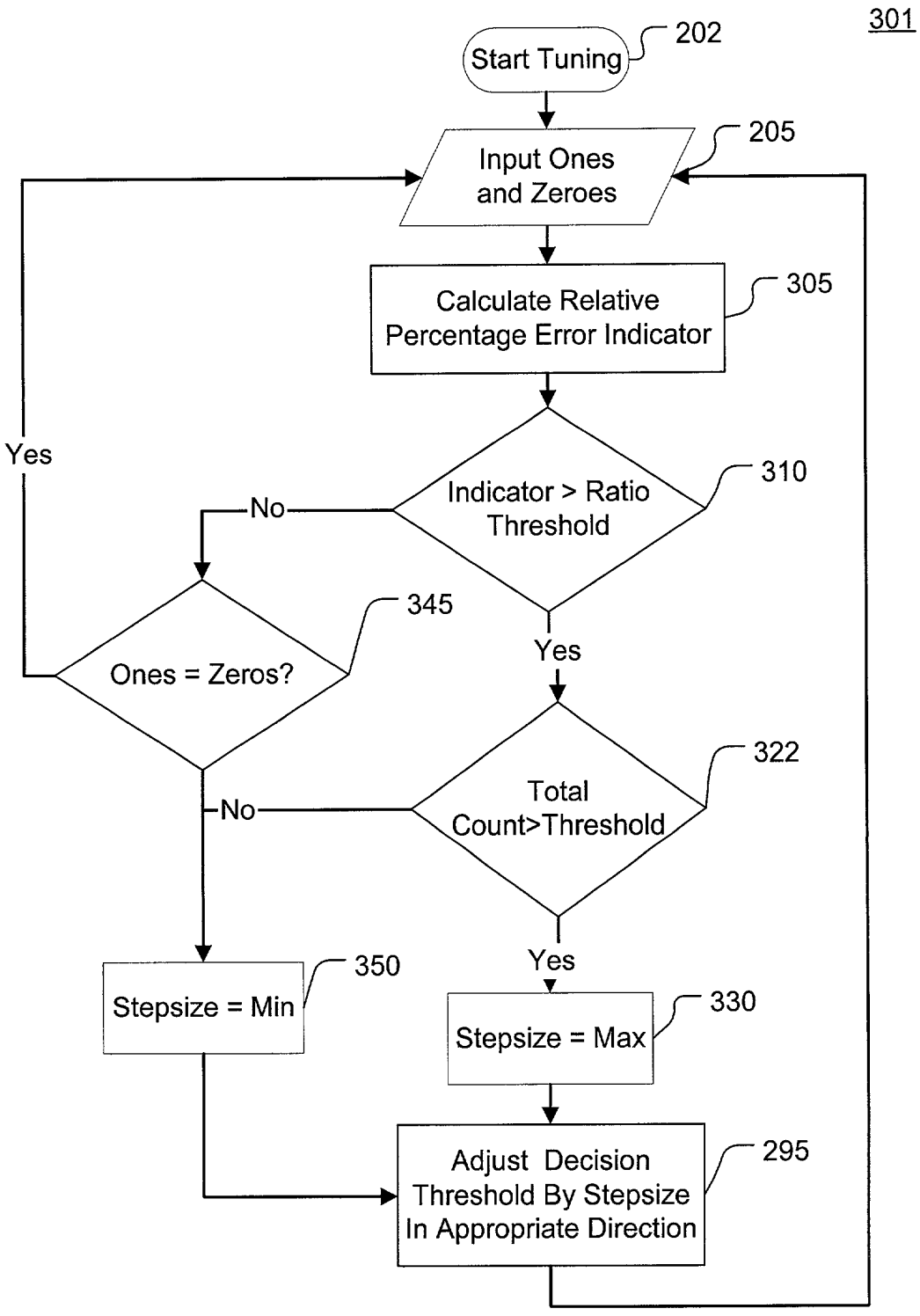
301
Start Tuning
202
Input Ones and Zeroes
205
Calculate Relative Percentage Error Indicator
305
Indicator > Ratio Threshold
310
No
Yes
Ones = Zeros?
345
Yes
No
Total Count>Threshold
322
Yes
Stepsize = Min
350
Stepsize = Max
330
Adjust Decision Threshold By Stepsize In Appropriate Direction
295

Figure 8b

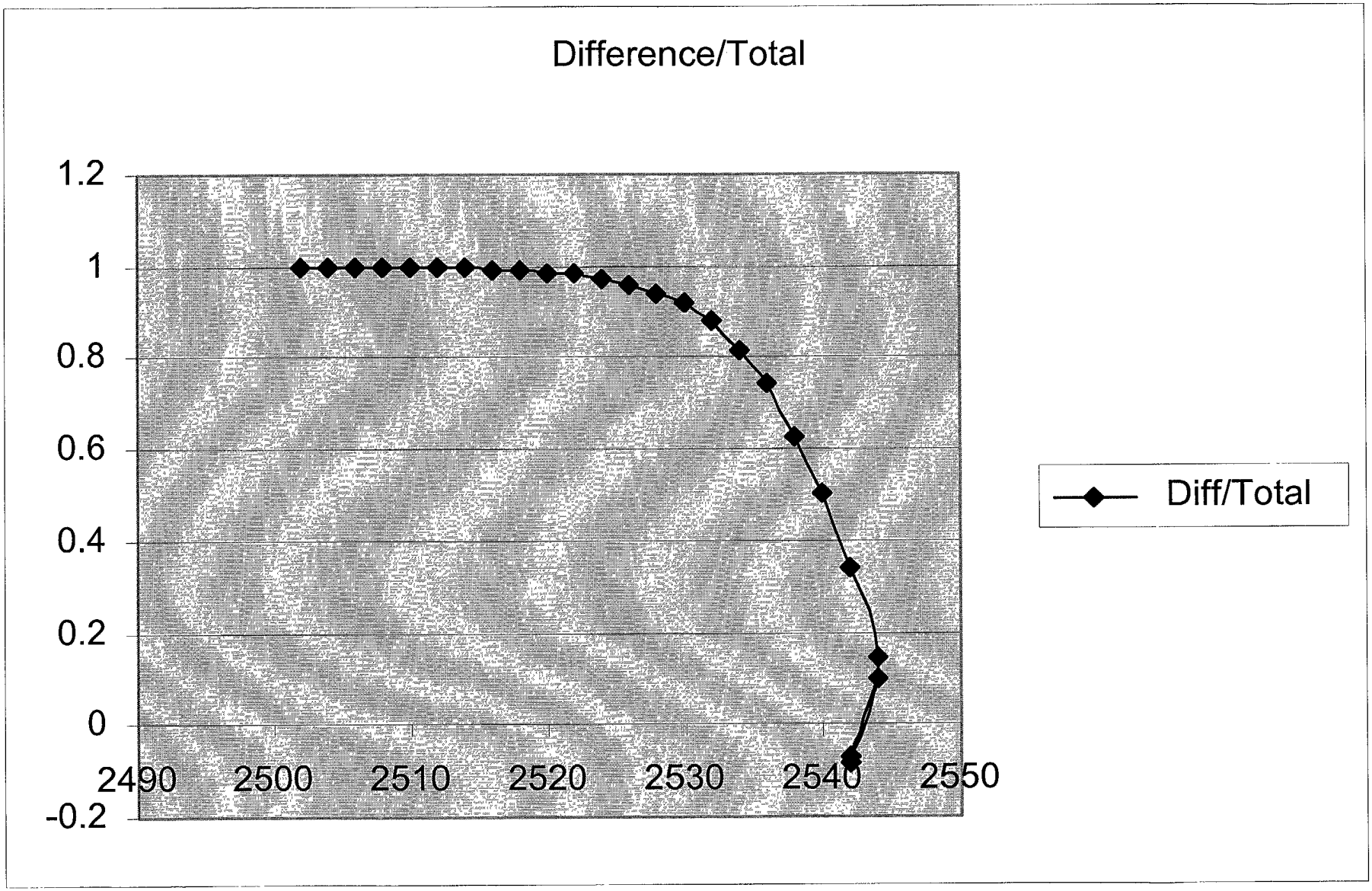
Difference/Total
1.2
1
0.8
0.6
0.4
0.2
0
-0.2
2490
2500
2510
2520
2530
2540
2550
Diff/Total

Figure 9

DAC	Ones	Zeros	Total errors	Diff/Total
2502	17898325	4050	17902375	0.999547546
2504	32450069	4857	32454926	0.999700693
2506	13368701	5745	13374446	0.999140899
2508	11257620	7322	11264942	0.998700038
2510	9465373	8801	9474174	0.998142107
2512	7873139	10330	7883469	0.997379326
2514	6544202	12816	6557018	0.996090906
2516	5441469	15528	5456997	0.994308958
2518	4519664	19173	4538837	0.99155158
2520	3788423	22576	3810999	0.988152188
2522	3135094	27696	3162790	0.982486349
2524	2532165	33787	2565952	0.973665135
2526	2093195	40792	2133987	0.961769214
2528	1682342	49836	1732178	0.94245857
2530	1376353	59057	1435410	0.917714103
2532	1131256	71939	1203195	0.880420048
2534	885459	88140	973599	0.81893983
2536	715597	106058	821655	0.741842988
2538	567115	129109	696224	0.629116491
2540	460630	151690	612320	0.50454011
2542	371422	183149	554571	0.33949305
2544	293295	218546	511841	0.146039493
2542	229267	265260	494527	-0.07278268
2544	277227	227935	505162	0.097576619
2542	226951	266724	493675	-0.08056515

Figure 10